NEWS SCIENCE NEWS

A SUPPRESSED THEORY OF NUCLEAR DECAY

The last decade of the 19th century was an exciting time for scientists. At Cambridge J.J. Thompson discovered the electron, a negatively charged particle which plays an important role in atomic structure hence chemical reactions. Becquerel and the Curies, on the other hand, discovered X-rays emanating from Uranium and penetrating cardboard to leave shadows on photographic film. Hanichi Muraoka, professor at Kyoto, Japan, wondered if glow-worms, which abounded during summer, might also emit something similar to these newly discovered X-rays. He did in fact find that the worms left an image on photographic film, through cardboard, though not where the cardboard was cut away, so he concluded that glow-worms emitted X-rays but that cardboard exerted a "suction effect" for X-rays, similar to the permeability of soft iron to magnetic lines of force.

The truth emerged later when Muraoka and Kasuya finally discovered that the glow-worms and fireflies emitted vapour which moistened the cardboard, and this wetness affected the photographic film. So worms were just chemistry, whilst X-rays were something entirely new beyond ordinary chemistry. In fact, they were produced in the nuclei of atoms.

Madame Curie, who later died of radiation sickness, found that large "radioactive" nuclei emitted Helium nuclei (two protons and two neutrons arranged at the vertices of a tetrahedron: (see Nexus Vol. 2, #5, pp 46-48).

When first emitted, these tetrahedral nuclei don't have the usual electrons orbiting in a cloud about them, and we refer to this kind of Helium as an α-particle. It is the emission of these alpha-particles ("tetrahedra") from Radium, say, that make the dials of wrist-watches glow in the dark and it is a nuclear, not a chemical, reaction.

Muraoka's glow-worm observations were at a time when scientists didn't realise the true origins of these emitted α-particles. It was one of the more hilarious moments in modern science ... x-ray emitting glow-worms indeed!!

Yet still today, most lay-people cannot grasp the difference between atomic (chemical) processes and nuclear ones. Nuclear reactions happen inside the sun, or inside an atom bomb, but not usually inside glow-worms or anywhere else about us that we are normally aware of.

This is all the more interesting because in 1895 two noted clairvoyants C.W. Leadbeater and Annie Besant, founders of the Theosophical Society, psychically studied atoms and atomic structures. They noted that the cores (nuclei) of trans-uranic elements had "spikes" protruding from them.

These nuclei were like large spheres dripping little droplets, radially outward, like water from a tap. [See Fig 1]

In the case of Radium nuclei the "spikes" of nuclear "fluid" were said to be about one nuclear diameter long. And it happens that, for ^{223}Radium, the emerging α-particles remain attached to the parent-nucleus by long viscous strands of nuclear matter which are about 1.4 nuclear diameters long!

In other nuclei these "spikes" can be up to 3 or 4 nuclear diameters long, before they finally snap to release the emerging tetrahedron. At the end of each of these spikes on a Uranium nucleus, according to the clairvoyants, is "a small globe ... ... containing the components of Helium atom"!

Now these are incredible observations! For one thing orthodox science was still confused between chemical and nuclear reactions, and it wasn't

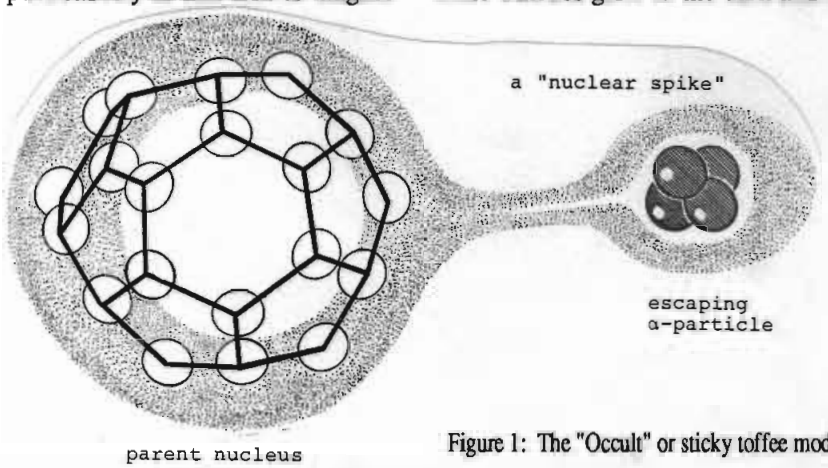


Figure 1: The "Occult" or sticky toffee model

The 19th century clairvoyant investigations of C.W. Leadbeater and Annie Besant, founders of the Theosophical Society, depicted large radioactive nuclei such as Radium, as spheres with radial outward moving spikes ... rather like two water droplets separating as on a dripping tap. They correctly stated that the length of the spikes is one or two nuclear diameters, and made the startling claim that each of the escaping small droplets contained "the components of a Helium atom"! Not even Madame Curie, a contemporary also studying "uranium rays", realised that they were α-particles. Because the escaping α-particle is still attached to the parent-nucleus by a long viscous strand of "nuclear-fluid" it is not free to accelerate away due to electrical repulsion, so its motion is slowed until the strand breaks.

proven that some "uranium rays" were Helium nuclei (α-particles) for at least a decade, until Lord Rutherford started his experiments. The clairvoyants had given a "liquid drop" explanation of a-particle emission from radioactive nuclei, long before orthodox science. Bohr and Wheeler made the "liquid drop" model of atomic nuclei into scientific orthodoxy in the 1940's, half a century later.

Even by the late 1920's orthodox science had no real understanding of the process. Gamow, Gurney and Condon realised that if an α-particle separated spontaneously from a parent nucleus would impart far too much motion energy to the escaping Helium nucleus. So it simply couldn't pop out of the nucleus and fly away. Instead, they argued, using the metaphysical imagery of Erwin Schrödinger's wave mechanics, it emerges from the nucleus but "blinks out of existence", then "tunnels" several nuclear diameters away from the parent nucleus, to a place where the electrical repulsion between the parent nucleus and the emerging α-particle is sufficiently reduced to impart the observed motion energy to the α-particle, and at that point the α-particle somehow re-materialises back into existence then flies away. [See Fig. 2]

The numbers all seemed to work out correctly, even if it was necessary to invoke the absurd hypothesis of "tunnelling", so this was one of the pillars on which modern wave-mechanical theory has been based. The quantum mechanical theory of "tunnelling" was considered a great triumph even though it was counter-intuitive and philosophically bizarre.

Advocates of "tunnelling" theory fail to appreciate that an α-particle emerging from a parent-nucleus is still half dissolved in nuclear fluid, and still attached to the parent nucleus, for some time as it initially draws away. This "sticky toffee" model of α-particle emission, though universally ignored, was put forward by clairvoyants in the

The "orthodox" quantum mechanical model

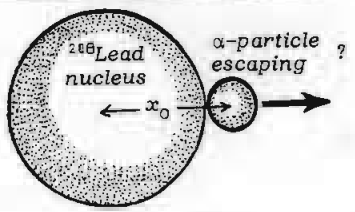


Figure 2A

If we imagine an α-particle emitted from a ^{212}Polonium nucleus, leaving behind a ^{208}Lead nucleus, then it turns out that the α-particle cannot have separated from the parent nucleus and been released at the nuclear surface (as above) because the mutual electrical repulsion between the two "spheres" would impart far too much motion energy to the escaping α-particle. This isn't what's happening.

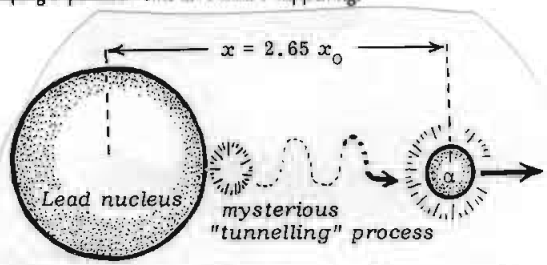


Figure 2B

To explain why the α-particle escapes with less energy than might be expected from electrical repulsion alone, Gamow, Gurney & Condon in 1928 proposed the notion of "tunnelling". The whole α-particle, having separated from the parent nucleus, simply blinks out of physical existence and tunnells several nuclear radii outwards. It eventually blinks back into physical existence, emerging from the "tunnel", at a place where the electrical repulsion is sufficiently reduced to produce the correct motion energy for the outgoing α-particle. The length of this mysterious "tunnel" depends upon the observed motion energy of the α-particle, as measured a long way from the nucleus. This weird idea is one of the foundations upon which modern quantum theory has been constructed.

1890's. Gamow, Gurney and Condon made the fundamental mistake of assuming that an α-particle emerging from a nucleus "sees" the same electrical repulsion, and is free to respond in the same way as, an α-particle approaching the nucleus from outside!

In fact one approaching from outside isn't attached to the "target" nucleus, whereas one emitted from a "parent" nucleus is. The viscous toffee-like strand attaching an emitted α-particle slows its escape, braking its outward acceleration, and preventing it from behaving like a totally free external α-particle. The quantum mechanical "tunnelling" process is just another way of viewing the stretching of a strand of nuclear fluid, out to some critical radius at which it snaps, prior to the release of the escaping α-particle.

This is a much more intuitive, and sensible explanation than the "tunnelling" idea introduced to quantum theory in 1928.

Another really interesting thing about the clairvoyant "classical-physics" interpretation of the process is that we can explain why nuclei emit α-particles in the first place. Quantum theory cannot explain why nucleons cluster into α-particles at the nuclear surface. We can! The earlier article on nuclear shells (NEXUS Vol.2, #5. pages 46-48) showed that nucleons (protons and neutrons) inside a nucleus, arrange themselves in concentric shells like the successive layers of an onion. The simplest shells are Platonic solids, with nucleons at each vertex. But in larger nuclei, the outer-shells are Buckey-Balls (named after Buckminster Fuller, inventor of the Geodesic Dome).

These Buckey Balls all have exactly 12 pentagonal faces, but any number of hexagonal faces depending upon how many vertices there are: ie:

the number of vertices = 20 + 2 x (the number of hexagonal faces)

As with the Platonic shells occurring

in lighter nuclei, there is a nucleon at each vertex of a buckey-ball nuclear shell. A buckey-ball with 60 vertices, for example, denoted BB60, has 12 pentagonal faces and 20 hexagonal faces.

Proof of the existence of buckey-ball nuclear shells was forthcoming in the late 1960's, when researchers at the Technischen Hochschule München studied deformations of rotating Gadolinium nuclei. They found that the ^{154}Gadolinium nucleus, with its unfilled BB60 outer shell, behaved like a "soft rotor" easily deformed by centrifugal and coriolis forces.

But when extra neutrons were added, completing the outermost nuclear shell, it became smaller, more spherical, and stiffer, hence more resistant to deformation due to rotation. The BB60 became a "stiff" spherical rotor, 20 times smaller than the incomplete outer shell of ^{154}Gadolinium.

This is the most direct and beautiful proof for the existence of structurally stable, rigid, buckey-ball shells in nuclei.

The interesting thing about buckey-balls is that they all have exactly 12 pentagonal faces. This is essential for them to close into "spheroidal" shapes.

This had, in fact been proven by the 18th century Swiss mathematician Leonhard Euler.

What happens then, when one buckey-ball enlarges, increasing its number of vertices by four? How can the number of pentagonal facets stay unchanged?

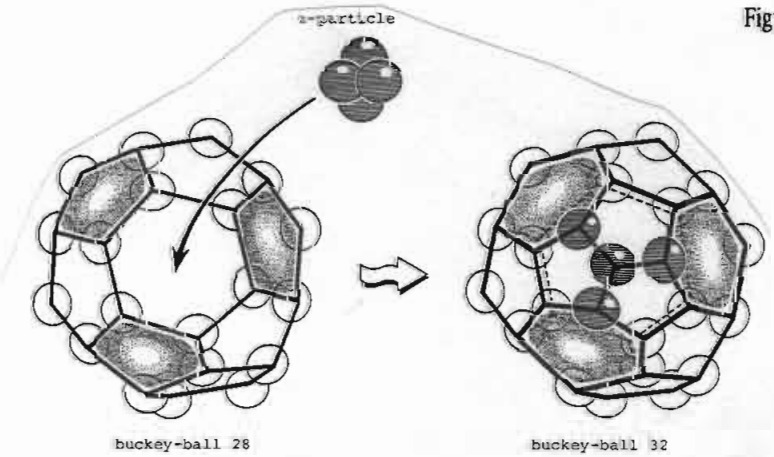
Consider the example of a BB28, absorbing an α-particle to become a BB32 as when a calcium nucleus becomes titanium. [See figure 3] In the α-capture process the BB28 (left) has one of its hexagonal faces turned into three new pentagons on the resulting BB32 (right).

However, three of the surrounding pentagons (shaded, left) are transformed into three new hexagons on the BB32 (shaded, right). Thus with one of the original hexagons lost, but three new ones produced, there is a nett gain of two hexagons. Also, as the three new pentagons produced by the captured α-particle are exactly cancelled by the loss of three originally surrounding ones, the total number of pentagonal faces remains the same (at 12) from one buckey-ball to the next.

This is a remarkable geometrical property of buckey-balls and α-particles, which explains α-clustering and α-decay in radioactive material.

Another victory to classical physics, over quantum dogma!

Figure 3



The capture of an α-particle by a BB28, produces a BB32. In this process one hexagonal facet is lost but three new ones are produced (shaded, above right) and although three new pentagons are produced where the α-particle is absorbed (above right), three are also lost (above, left, shaded), leaving the total number of pentagonal facets invariant and equal to 12.

NEW MAGNETIC MATERIAL DISCOVERED IN THE HUMAN BRAIN

Microscopic magnetic material has been discovered in the human brain.

Geobiologist Joseph L. Kirschvink of the Californian Institute of Technology says:- "They are like biological bar magnets, made of crystals of the iron mineral magnetite".

"The crystals are strongly magnetic, unlike other iron compounds in the body. They come in two sizes, about one-millionth, and one 10 millionths of an inch wide."

"Homing pigeons, whales, salmon, honeybees and some shellfish and bacteria have microscopic magnets. Unlike some of those creatures, however, there is no convincing evidence that people can navigate by using internal magnets to sense Earth's magnetic field," Kirschvink said.

"The presence of these particles open that possibility, although their purpose is unknown" he said.

These microscopic magnets might explain alleged links between cancer and electromagnetic fields.

Until now many scientists doubted any real links between electromagnetic fields and cancer because they thought there were no plausible mechanisms by which E/M fields could affect biological tissue.

Kirschvink's research found an average brain contains about 7 billion microscopic magnets, weighing a total of one-millionth of an ounce.

(Source: Associated Press; New York Times)

GENETICALLY ENGINEERED PLANT THAT GROWS PLASTIC

A genetically engineered plant has been made to grow a form of environmentally friendly plastic, which could become a new cash crop for farmers.

According to the journal *Science*, scientists said their plants manufactured a plastic material known as PHB, or

polyhydroxybutyrate, after two key genes were inserted into their structure.

PHB, is naturally made by soil bacteria, and is currently used by a British company to make biodegradable shampoo bottles. The researchers said it is similar to polypropylene, a light plastic widely used in various kinds of containers, wraps and coatings.

Christopher Somerville, a botany professor at the Michigan State University - Department of Energy Plant Research Laboratory, and one of the authors of the report said "This research opens the way for a possible new a profitable cash crop for farmers".

Somerville said PHB grown in bacteria is a costly plastic: around US$12- a pound. Plastics derived from petroleum cost around 50 cents a pound. If PHB can be grown in farm crops such as potatoes, the price could be cut.

(Source: MUFONET Information Network, 27/4/'92)

IS PRO HART'S AMAZING INVENTION BEING DELIBERATELY SUPPRESSED?

The world knows about Pro Hart the artist, but not many know about his remarkable skills as an inventor.

Over the last ten years, Pro has been tinkering on ways to improve fuel consumption, and has recently come up with something quite amazing.

His updraft fuel converter does improve fuel consumption considerably, but the most remarkable effect of his converter is that it virtually eliminates all pollutants from the motor vehicle emissions.

On the latest computerised testing equipment at the Excelsior Service Station in Broken Hill, Pro's prototype converter fitted to a Ford 4.1 records just 38 units of hydrocarbon at idling speed, compared to 300 under normal anti-pollution systems, and at 2,600rpm hydrocarbons drop to zero!

Carbon monoxide emissions at idle are 0.13% compared to a normal recording of 2.5%. They rise only slightly at 2,600rpm to 0.15%.

This signifies that there is no unburnt fuel in the emissions, which has resulted in better fuel consumption - between 15 - 30% better according to Pro.

Steve Simmons, the service station owner is amazed at the results, and claims that the converter has achieved similar results on Pro's old Chevrolet and his Bentley.

Despite the amazing results, none of the media organisations, or motoring magazines contacted by Pro are interested enough to publicise his findings.

Pro reports an eminent Canberra scientist who developed a similar device has also had great difficulty having his invention accepted.

The only media coverage to date about Pro's invention has been the Barrier Daily Truth, 15th April 1992). He said that plenty of people have come and done interviews, but none of it ever ends up in print or on TV.

Shame on the TV current affairs programmes that won't show Pro's invention to the public, and shame on the sunday newspapers who likewise won't print the story they have already researched.

GIANT FUNGUS FOUND IN THE USA

A couple of months ago, the British science journal *Nature* published a story about a giant fungus discovered in Michigan. This underground fungus, classified as *Armillaria Bulbosa*, covers an area of 38 acres!

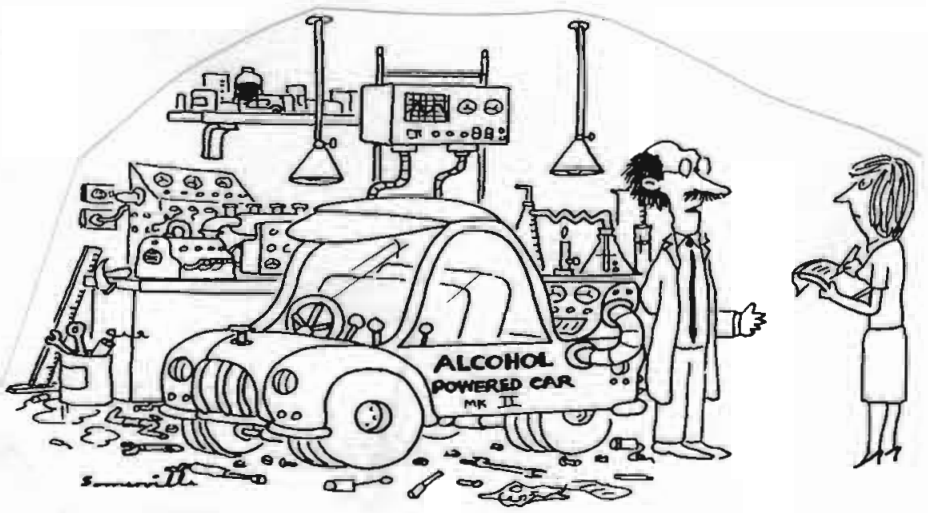
It was classed as the world's largest living organism until a few weeks ago, forest rangers in Washington claim to have found an even bigger fungus - so large, that its tentacles extend into three states.

Ken Russell, a forest pathologist for the Washington Department of Natural Resources said the Washington fungus covers 1,500 acres, and lives beneath the forested slopes of Mount Adams, a dormant volcano in southwest Washington.

Russell said the organism came to the attention of forest rangers because it kills trees by eating their roots for food.

A U.S. Forest Service pathologist Terry Shaw said the giant fungus is likely to be between 400 and 1,000 years old.

(Source: MUFONET Information Network, echoed on ASTRONET)



"It gets great mileage but it stops every half hour to urinate."